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(54) LEAD DELIVERY DEVICE AND METHOD

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(58) Field of Classification Search

(56) References Cited

U.S. PATENT DOCUMENTS

4,215,703 A	8/1980	Willson
4,497,326 A	2/1985	Curry
4,619,246 A	10/1986	Molgaard-Nielsen et al.
5,125,904 A	6/1992	Lee
5,147,377 A	9/1992	Sahota
5,167,239 A	12/1992	Cohen et al.
5,181,911 A	1/1993	Shturman
	(Con	tinued)

FOREIGN PATENT DOCUMENTS

EP	0 861 676 A2	9/1998	
\mathbf{EP}	2197540 A1	6/2010	
	(Continued)		

OTHER PUBLICATIONS

(PCT/US2009/050783) PCT Notification of Transmittal of the International Search Report and the Written Opinion of the International Searching Authority, 15 pages, Mar. 3, 2010.

(Continued)

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(57) ABSTRACT

A medical apparatus includes a guidewire and a fixator catheter. The fixator catheter comprises a tubular body with a distal portion and a proximal portion, and further includes a distal opening, a fixator secured to the distal portion, and a body opening arranged between the fixator and the proximal portion. The guidewire passes through the body opening and the distal opening of the fixator catheter. The fixator is movable between a compact configuration and an expanded configuration and, in the expanded condition, is capable of anchoring the guidewire and fixator catheter in a lumen of a blood vessel.

29 Claims, 14 Drawing Sheets

